



iMcV-Gigabit

Operation Manual

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**ISO 9001:2000
REGISTERED**



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If the product's part number begins with an "8", it is compliant with the Restriction of Hazardous Substances (RoHS) directive.



FCC Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B computing device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which the user will be required to correct the interference at his own expense.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

The use of non-shielded I/O cables may not guarantee compliance with FCC RFI limits. This digital apparatus does not exceed the Class B limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de classe B prescrites dans le Règlement sur le brouillage radioélectrique publié par le ministère des Communications du Canada.

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IMC Networks warrants to the original end-user purchaser that this product, EXCLUSIVE OF SOFTWARE, shall be free from defects in materials and workmanship under normal and proper use in accordance with IMC Networks' instructions and directions for a period of six (6) years after the original date of purchase. This warranty is subject to the limitations set forth below.

At its option, IMC Networks will repair or replace at no charge the product which proves to be defective within such warranty period. This limited warranty shall not apply if the IMC Networks product has been damaged by unreasonable use, accident, negligence, service or modification by anyone other than an authorized IMC Networks Service Technician or by any other causes unrelated to defective materials or workmanship. Any replaced or repaired products or parts carry a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

To receive in-warranty service, the defective product must be received at IMC Networks no later than the end of the warranty period. The product must be accompanied by proof of purchase, satisfactory to IMC Networks, denoting product serial number and purchase date, a written description of the defect and a Return Merchandise Authorization (RMA) number issued by IMC Networks. No products will be accepted by IMC Networks which do not have an RMA number. For an RMA number, contact IMC Networks at PHONE: (800) 624-1070 (in the U.S and Canada) or (949) 465-3000 or FAX: (949) 465-3020. The end-user shall return the defective product to IMC Networks, freight, customs and handling charges prepaid. End-user agrees to accept all liability for loss of or damages to the returned product during shipment. IMC Networks shall repair or replace the returned product, at its option, and return the repaired or new product to the end-user, freight prepaid, via method to be determined by IMC Networks. IMC Networks shall not be liable for any costs of procurement of substitute goods, loss of profits, or any incidental, consequential, and/or special damages of any kind resulting from a breach of any applicable express or implied warranty, breach of any obligation arising from breach of warranty, or otherwise with respect to the manufacture and sale of any IMC Networks product, whether or not IMC Networks has been advised of the possibility of such loss or damage.

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Safety Certifications

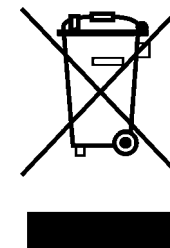
UL/CUL: Listed to Safety of Information Technology Equipment, including Electrical Business Equipment.

CE: The products described herein comply with the Council Directive on Electromagnetic Compatibility (89/336/EEC) and the Council Directive on Electrical Equipment Designed for use within Certain Voltage Limits (73/23/EEC). Certified to Safety of Information Technology Equipment, Including Electrical Business Equipment. For further details, contact IMC Networks.



**Class 1 Laser product, Luokan 1 Laserlaitte,
Laser Klasse 1, Appareil A'Laser de Classe 1**

European Directive 2002/96/EC (WEEE) requires that any equipment that bears this symbol on product or packaging must not be disposed of with unsorted municipal waste. This symbol indicates that the equipment should be disposed of separately from regular household waste. It is the consumer's responsibility to dispose of this and all equipment so marked through designated collection facilities appointed by government or local authorities. Following these steps through proper disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about proper disposal, please contact local authorities, waste disposal services, or the point of purchase for this equipment.



IMC Networks Technical Support

Tel: (949) 465-3000 or (800) 624-1070 (in the U.S. and Canada);
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About the iMcV-Gigabit™

The SNMP-manageable iMcV-Gigabit module provides a single conversion between 1000 Base-T twisted pair and 1000 Base-SX/LX fiber. Each iMcV-Gigabit includes one RJ-45 connector and one pair of SC fiber optic connectors. iMcV-Gigabit modules install in any modular, SNMP-manageable iMediaChassis and iMediaCenter series chassis as well as the MediaChassis series, which is unmanaged.

The iMcV-Gigabit is also available in a single-strand fiber version that allows two wavelengths to share one fiber strand—Full-Duplex data travels on different wavelengths (1310 nm and 1550 nm)—doubling the capacity of fiber. Also, one RJ-45 connector and one SC fiber connector are included.

iMcV-Gigabit is part of the iMcV series. Information for other iMcV modules can be found in their respective manuals and on the IMC Networks Web site at: <http://www.imcnetworks.com/support/>.

NOTE
All iMcV-Gigabit modules, including 1300 multi-mode and 1310 single-mode (TX/LX), 850 nm multi-mode fiber (TX/SX) and single-strand versions (TX/SSLX) will be referred to as iMcV-Gigabit throughout this guide except where differences need to be indicated.

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Specifications

Environmental

Operating Temperature: 32° - 104° F (0° - 40° C)

Storage Temperature: 0° - 160° F (-20° - 70° C)

Humidity: 5 - 95% (non-condensing)

Power Consumption (Typical)

iMcV-Gigabit (-10): 0.55 Amp

iMcV-Gigabit (-00): 1.30 Amp

Fiber Optic Specifications

For fiber optic specifications, please visit: <http://www.imcnetworks.com/adocs/fcs.asp>

Configuration Instructions

iMcV-Gigabit Modules have user-configurable features. Instructions for configuring both managed (via an SNMP-compatible management application such as iView²) and unmanaged iMcV-Gigabit modules follow.

Managed Modules

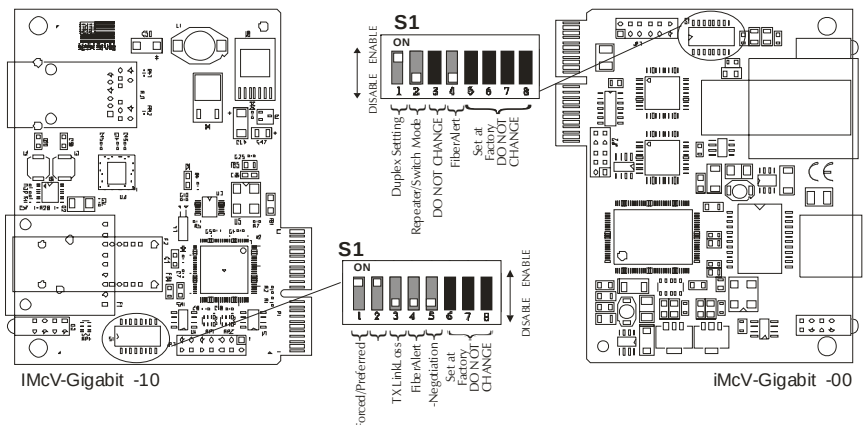
To manage one or more iMcV-Gigabit Modules, an SNMP agent must be present in the chassis: iMediaCenter chassis have embedded management; iMediaChassis series chassis use an SNMP management module. To configure managed modules, install the module first, and then configure using the management software. Refer to the iView² for MediaConverters online help file for more information and assistance.

NOTE

Management software will override hardware settings (e.g., jumper, switch, etc.), so you must configure a module that will be managed via the software. Until you configure a managed module via the software, the module (and its LEDs) may not work properly.

Unmanaged Modules

Before installing, configure iMcV-Gigabit Modules for desired features. The diagrams below show the switch location on iMcV-Gigabit. The chart below states the available features and settings for each module. After configuring the switch for the desired settings, install the module (see page 9) and connect the appropriate cables.



All other part numbers, including RoHS

50-1482X and 50-1483X

DIP Switch Configuration Chart			
Module	Feature	DIP Switch on S1	Default
iMcV-Gigabit -00 board	Duplex Setting	1	ON (FDX)
	Master/Slave	2	OFF (Slave)
	FiberAlert	4	OFF
iMcV-Gigabit -10 board	Forced/Preferred	1	ON
	Master/Slave	2	ON
	TX LinkLoss	3	OFF
	FiberAlert	4	OFF
	FX Auto-Negotiation	5	OFF

About LinkLoss and FiberAlert

iMcV-Gigabit modules include the troubleshooting features FiberAlert and TX LinkLoss that help locate *silent failures* on your network. It is vital that you understand how FiberAlert and LinkLoss work, and how they will react in your network configuration, before attempting to install the module(s).

WARNING

Installing modules without understanding the effects of LinkLoss and FiberAlert can cause functioning units to appear flawed or even dead.

About Link Integrity

During normal operation, link integrity pulses are transmitted by all point-to-point Ethernet devices. When an IMC Networks media converter receives valid link pulses, it knows that the device to which it is connected is up and sending pulses, and that the copper or fiber cable coming from that device is intact. The appropriate “LNK” (link) LED is lit to indicate this.

The IMC Networks media converter also sends out link pulses from its copper and fiber transmitters, but normally has no way of knowing whether the cable to the other device is intact and the link pulses are reaching the other end. The combination of FiberAlert and LinkLoss allows this information to be obtained, even when physical access to a remote device (and its link integrity LED) is not available.

What is TX LinkLoss?

TX LinkLoss is a troubleshooting feature. When a fault occurs on the twisted pair segment of a conversion, TX LinkLoss detects the fault and passes this information to the fiber segment. If a media converter is not receiving a twisted pair link, TX LinkLoss disables the transmitter on the media converter's fiber port. The result is in a loss of the link on the device connected to the fiber port.

Installation Troubleshooting

- During installation, first test the fiber and twisted pair connections with all troubleshooting features disabled, then enable these features, if desired, just before final installation. This will reduce the features' interference with testing.
- When working with units where the features cannot be disabled, you must establish BOTH your twisted pair and fiber connections before the link LEDs will light.
- When connecting the fiber interface of an iMcV-Gigabit module (-00) to the fiber interface of a Gigabit switch (with fixed configuration or modular design, GBIC/SFP), you may experience difficulty establishing a link. Please check the following:
 - Solution 1**—Within the switch configuration (either via SNMP or a CLI), ensure that the setting for the fiber port in use is set to 1000 Mbps, Full-Duplex. Manually setting the switch port will result in normal operation and a link will be established. Also, ensure auto-negotiation is switched OFF.
 - Solutions 2**—Within the switch configuration, ensure that IEEE 802.3x Flow Control is disabled for the Gigabit port in use.
- If using a high powered device (which is designed for long distance installations) for a short distance installation, the fiber transmitters may overdrive the receivers and cause data loss. If this is the case, you may need to add an optical attenuator to your connection.

For fiber specifications, visit the IMC Networks Web site at www.imcnetworks.com/adocs/fcs.asp or contact IMC Networks for more information.

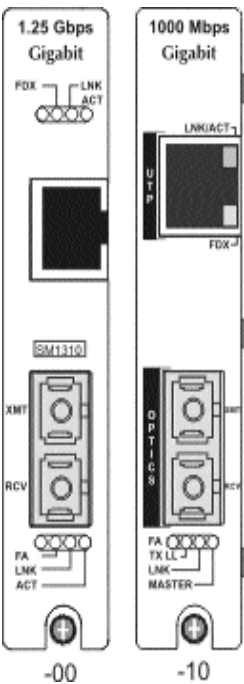
product that has 1550 xmt and 1310 rcv, e.g., McGigabit, TX/SSFX-SM1550-SC. The two connected products must also have the same speed and distance capabilities (i.e., both are single-mode [20km] or both are single/PLUS [40km]).

Twisted Pair Crossover/Pass-Through Connections

iMcV-Gigabit Modules support both crossover and straight-through Cat5 twisted pair cabling types of connections with AutoCross a feature which automatically selects between the two, depending on the connected device.

LED Operation

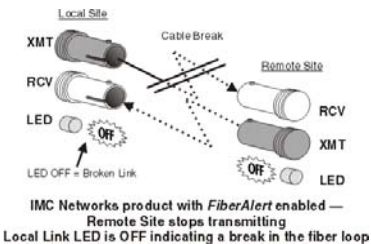
Each iMcV-Gigabit Module features diagnostic LEDs (see diagram below) that provide information on features and ports.



iMcV-Gigabit (-10)	iMcV-Gigabit (-00)
LNK/ACT —glows green when a twisted pair link is established. Blinks green when data is detected on the port. Located on RJ-45 connector.	ACT —glows amber when data is detected on the port.
FDX —glows amber when port is operating in Full-Duplex mode. Located on RJ-45 connector.	LNK —glows green when a twisted pair link is established.
TX LL —glows green when TX LinkLoss is enabled on the port.	FDX —glows green when operating in Full-Duplex mode.
LNK —glows green when fiber link.	FA —glows green when FiberAlert is enabled.
MASTER —glows amber when operating as a Master.	

What Is FiberAlert?

FiberAlert minimizes the problems associated with the loss of one strand of fiber. If a strand is unavailable, the IMC Networks device at the receiver end notes the loss of link. The device will then stop transmitting data and the link signal until a signal or link pulse is received. The result is that the link LED on both sides of the fiber connection will go out indicating a fault somewhere in the fiber loop. Using FiberAlert, a local site administrator is notified of a fault and can quickly determine where a cable fault is located.



WARNING

Enable FiberAlert on one side of a media conversion only. Enabling it on both sides would keep both transmitters off indefinitely.

Using FiberAlert and LinkLoss

Modules ship from the factory with troubleshooting features disabled. Refer to the configuration instructions on pages 5-6 of this manual, or the help file to enable/disable this feature. The following chart provides an overview of the troubleshooting features, their functionality and the recommended settings for a pair of media converters in a typical central/main site to remote site application:

LinkLoss/FiberAlert Compared			
Feature	Fault Location	Disabled LEDs	Enable at
TX LinkLoss	Twisted Pair	Fiber	Remote site only
FiberAlert	Fiber	Fiber	Remote site only

For more information on LinkLoss/FiberAlert, visit the IMC Networks Web site at <http://www.imcnetworks.com/support/> If you are unsure of how best to implement these features in your configuration, contact IMC Networks technical support at (800) 624-1070 (U.S./Canada), +32-16-550880 (Europe) or via e-mail at: techsupport@imcnetworks.com.

Additional Gigabit Features

Master/Slave Mode

The Master/Slave mode feature determines which clock will be used between the iMcV-Gigabit and the device it is connected to (a switch, NIC, or another iMcV-Gigabit, etc). Slave mode (S1-2 is ON) is the default setting. In Slave mode, iMcV-Gigabit will receive and use the clock of the connected device. Master mode uses iMcV-Gigabit's clock. The Master/Slave mode is only valid for the twisted pair link and is hardware configurable only.

On the iMcV-Gigabit (-00) module, Master/Slave modes are referred to as Switch/Repeater modes; Switch is the Master mode and Repeater is the Slave mode.

Check the Installation Troubleshooting section on page 11 if you are having difficulty linking up.

Preferred/Forced Mode

In addition to Master/Slave modes, iMcV-Gigabit (-10) modules also include Preferred/Forced modes for Master/Slave negotiation. Preferred mode helps determine whether the module should act as a Master or Slave. Forced Mode should typically only be used when connecting to some legacy switches, or when there is difficulty establishing a link. The default is Preferred mode (S1-1 is ON). This feature is hardware configurable only.

Since most switches today typically function as Masters, IMC Networks recommends configuring iMcV-Gigabit (-10) modules as indicated in the following chart:

DIP Switch	Setting
S1-1	On-Preferred
S1-2	On-Slave

Duplex Mode on iMcV-Gigabit (-00)

The Duplex mode settings of the iMcV-Gigabit (-00) converter are used with Auto-Negotiation. The default duplex mode for iMcV-Gigabit (-00) is Full-Duplex. In this mode, the module advertises Full-Duplex during Auto-Negotiation. To make the unit advertise and operate in Half-Duplex, move DIP switch 1 to the OFF position. Auto-Negotiation takes place on the twisted-pair interface only. When the twisted-pair interface is resolved, the configuration will be encoded into the fiber side. No Auto-Negotiation takes place on the fiber side. As a result, it is usually best to disable Auto-Negotiation on the remote fiber end. Since most gigabit networks run at Full-Duplex, IMC Networks recommends setting the remote fiber end to Full-Duplex.

NOTE

Setting the duplex mode on iMcV-Gigabit (-10) modules is not required; auto-negotiation functionality includes the duplex setting.

FX Negotiation on iMcV-Gigabit (-10)

iMcV-Gigabit (-10) modules include the FX Negotiation feature which negotiates duplex mode. The default for this feature is disabled. You must enable or disable this feature on both ends of the connection or you may have difficulty establishing a link. If the device you are connecting to the iMcV-Gigabit module does not support auto-negotiation, disabling the feature on the iMcV-Gigabit module forces the link up. The following table shows various configurations and the resulting link status:

FX Auto-Negotiation on a Switch or iMcV-Gigabit	FX Auto-Negotiation on iMcV-Gigabit (S5)	Link Status
iMcV-Gigabit-Off	OFF	Link
iMcV-Gigabit-ON	ON	Link
iMcV-Gigabit-Off	ON	No Link
Switch-ON	OFF	No Link
Switch-ON	ON	Link
Switch-OFF	OFF	Link
Switch-OFF	ON	Link

Installing an iMcV Module

iMcV Modules install in IMC Networks' SNMP-manageable media converter chassis or in any MediaChassis. To install an iMcV Module, remove the blank bracket covering the slot where the module is to be installed by removing the screws on the outside edges of the bracket. Slide the iMcV Module into the chassis, via the cardguides, until the module is seated securely in the connector. Secure the module to the chassis by tightening the captive screw. Save any "blanks" removed during installation for future use if the configuration requirements change.

Installation Tips

When testing, IMC Networks recommends testing modules first in an unmanaged environment. To do this, disable management (turn management off or remove the management module from the chassis), follow the unmanaged configuration instructions, then install the unit, connect the cables and test the LEDs. When finished, re-activate management and configure the unit via the software. Since single-strand fiber products use optics that transmit and receive on two different wavelengths, you must deploy single-strand fiber products in pairs, or connect two compatible IMC Networks single-strand fiber products. For example, connect iMcV-Gigabit, TX/SSFX-SM1310-SC (which has 1310 xmt and 1550 rcv) to a